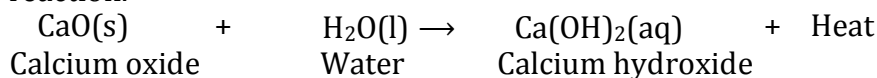


DEHRADUN PUBLIC SCHOOL
ASSIGNMENT 2022-23
SUBJECT-SCIENCE (086)
CLASS -X

Chapter-1: Chemical Reactions

Case-based Type Questions:

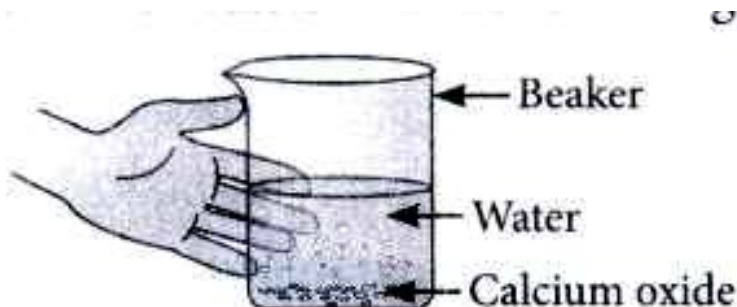
Q1. A reaction in which two or more reactants combine to form a single product is called a combination reaction. For example, calcium oxide reacts vigorously with water to form calcium hydroxide. The reaction is highly exothermic in nature, as lots of heat is produced during the reaction.



Solution of Ca(OH)_2 is used for white wash the walls. Calcium hydroxide reacts slowly with carbon dioxide in air to form a thin layer of calcium carbonate on the wall which gives a shiny appearance to wall. Calcium carbonate will form after two or three days of white wash.

Read the passage carefully and answer the following questions:

- i. What is the chemical name of quick lime?
 - a. Calcium oxide
 - b. Calcium carbonate
 - c. Calcium hydroxide
 - d. Carbon dioxide
- ii. When carbon dioxide is passed through lime water,
 - a. calcium hydroxide is formed
 - b. white precipitate of Calcium oxide is formed
 - c. lime water turns milky
 - d. colour of lime water becomes green
- iii. Following observations are observed when calcium oxide reacts vigorously with water.



Identify the incorrect observations

- | | |
|-----------------------------------|------------------------------------|
| (I) It is an endothermic reaction | (II) Slaked lime is produced. |
| (III) Quick lime is produced. | (IV) It is an exothermic reaction. |
| (V) It is a combination reaction | |
- a. (I) and (II)
 - b. (III) and (IV)
 - c. (I) and (III)
 - d. (II), (IV) and (V)
- iv. Quick lime combines vigorously with water to form (A) which reacts slowly with the carbon dioxide in air to form (B)

Identify the compounds(A) and (B)

(A)	(B)
a. Calcium carbonate	Calcium hydroxide
b. Calcium hydroxide	Calcium carbonate
c. Calcium	Calcium bicarbonate
d. Calcium bicarbonate	Calcium

- iii. Lead nitrate reacts with potassium iodide to give lead iodide and potassium nitrate.
- iv. Barium chloride reacts with aluminium sulphate to give aluminium chloride and barium sulphate.

- Q15.** i. Define a balanced chemical equation. Why should an equation be balanced?
ii. Write the balanced chemical equation for the following reaction:
- a. Phosphorus burns in presence of chlorine to form phosphorus penta chloride.
 - b. Burning of natural gas.
 - c. The process of respiration.
- Q16.** A zinc plate was put into a solution of copper sulphate kept in a glass container. It was found that blue colour of the solution gets fader and fader with the passage of time. After few days, when zinc plate was taken out of the solution, a number of holes were observed on it.
- i. State the reason for changes observed on the zinc plate.
 - ii. Write the chemical equation for the reaction involved.

Chapter-2: Acids, Bases and Salts

Case-based Type Questions:

- Q1.** Plaster of Paris is a quick setting gypsum plaster consisting of a fine white powder which hardens when moistened and allowed to dry. Plaster of Paris is so called because of its preparation from the abundant gypsum found near Paris. It does not generally shrink or crack when dry, making it an excellent medium for casting moulds. It is commonly used to precast and hold parts of ornamental plaster work placed on ceilings and cornices. It is also used in medicine to make plastic casts to immobilize open bones while they heal though many modern orthopaedic cast are made of fiberglass or thermoplastics. Plaster of Paris is prepared by heating calcium sulphate dihydrate to 120-180°C.

Read the passage carefully and answer the following questions:

- i. Calcium sulphate dihydrate is also called
 - a. Calcium carbonate.
 - b. Gypsum
 - c. Plaster of Paris
 - d. Slaked lime
- ii. Chemical name of plaster of paris is
 - a. Calcium sulphate dihydrate.
 - b. Calcium sulphate hemihydrate
 - c. Calcium sulphate.
 - d. Calcium sulphate trihydrate
- iii. Plaster of Paris is so named because
 - a. It is used to build sculptures in Paris
 - b. It is found only in Paris and is imported by all other countries
 - c. It is manufactured from abundant calcium found near Paris
 - d. It is manufactured from abundant gypsum found near Paris
- iv. Which of the following is a property of Plaster of Paris?
 - a. It hardens when moistened
 - b. It does not shrink when dry
 - c. It does not crack easily when dry
 - d. All of these
- v. Which of the following can be used to cast a plaster on broken bones to heal them?
 - a. Plaster of Paris
 - b. Fiberglass
 - c. Thermoplastics
 - d. All of these

Objective Type Questions:

- Q2.** What happens when a solution of an acid is mixed with a solution of a base in a test tube?
- i. Temperature of the solution decreases
 - ii. Temperature of the solution increases
 - iii. Temperature of the solution remains the same
 - iv. Salt formation takes place
- a. i. and iv.
 - b. i. and iii.
 - c. ii. only
 - d. ii. and iv.

- Q3.** Which one of the following salts does not contain water of crystallisation?
 a. Blue vitriol
 b. Baking soda
 c. Washing soda
 d. Gypsum
- Q4.** In terms of acidic strength, which one of the following is in the correct increasing order?
 a. Water < Acetic acid < Hydrochloric acid
 b. Water < Hydrochloric acid < Acetic acid
 c. Acetic acid < Water < Hydrochloric acid
 d. Hydrochloric acid < Water < Acetic acid
- Q5.** Assertion(A): Salts are the products of an acid base reaction.
 Reason(R): Salts may be acidic or basic.
 a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 c. If Assertion is true but Reason is false.
 d. If Assertion is false but Reason is true
- Q6.** Assertion(A): When common salt is kept open, it absorbs moisture from the air.
 Reason(R): Common salt contains magnesium chloride.
 a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 c. If Assertion is true but Reason is false.
 d. If Assertion is false but Reason is true

Short Answer Type Questions:

- Q7.** Give reasons:
 i. Curd and sour substances are not kept in brass and copper vessels.
 ii. Dry HCL gas does not change the colour of the dry litmus paper.
 iii. It is recommended that acid should be added to water and not water to the acid.
 iv. Distilled water does not conduct electricity, whereas rain water does.
- Q8.** Define the following terms: neutralization reaction, chloralkali process, and antacids.
- Q9.** Name the acid present in the following:
 i. Tomato
 ii. Vinegar
 iii. Tamarind
- Q10.** Explain how antacid works.
- Q11.** A student detected the pH of four unknown solutions A, B, C and D as follows 11, 5, 7 and 2. Predict the nature of the solution.
- Long Answer Type Questions:**
- Q12.** Equal length of magnesium ribbon are taken in two test tubes 'A' and 'B' H_2SO_4 is added to test tube 'A' and H_2CO_3 in the test tube 'B' in equal amounts:
 i. Identify the test tube showing vigorous reaction.
 ii. Give reason to support your answer.
 iii. Name the gas liberated in both the tubes. How will you prove its liberation?
- Q13.** Describe an activity with diagram to illustrate that the reaction of metal carbonates and metal bicarbonates with acids produces carbon dioxide. Write the relevant equations of all the reactions that take place. Name any two forms in which calcium carbonate is found in nature.
- Q14.** Identify the acid and the base whose combination forms the common salt that you use in your food.
 i. Write its formula and chemical name of this salt. Name the source from where it is obtained.
 ii. What is rock salt? Mention its colour and the reason due to which it has this colour.
 iii. What happens when electricity is passed through brine? Write the chemical equation for it.
- Q15.** Dry pellets of a base 'X' when kept in open absorbs moisture and turns sticky. The compound is also formed by chlor-alkali process. Write chemical name and formula of X. Describe chlor-alkali process with balanced chemical equation. Name the type of reaction occurs when X is treated with dilute hydrochloric acid. Write the chemical equation.
- Q16.** Identify the compound of calcium which is yellowish white powder and is used for disinfecting drinking water. Write its chemical name and formula. How is it manufactured? Write the chemical equation for the reaction involved. Also list two other uses of the compound.

CHAPTER-3: Metals and Non Metals

Case-based Type Questions:

Q1. All metals do not react with oxygen at the same rate. Different metals show different reactivities towards oxygen. Metals such as potassium and sodium react so vigorously that they catch fire if kept in open. Hence, to protect them and to prevent accidental fire, they are kept immersed in kerosene oil. At ordinary temperature the surfaces of metals such as magnesium, aluminium, zinc, lead etc. are covered with a thin layer of oxide. The protective oxide layer prevents the metal from further oxidation. Iron does not burn on heating but iron filling burn vigorously when sprinkled in the flame of the burner. Copper does not burn, but the hot metal is coated with a black colour layer of copper oxide. Silver and gold do not react with oxygen even at high temperature.

Read the passage carefully and answer the following questions:

- i. When copper is heated in air then it does not burn but react with oxygen to form a black colour compound. This black coloured compound is:
 - a. Copper sulphide
 - b. Copper carbonate
 - c. Copper oxide
 - d. Copper sulphate
- ii. The metal which has low reactivity:
 - a. Ag
 - b. Au
 - c. K
 - d. Both a. and b.
- iii. Which of the following metal is kept in kerosene to prevent its oxidation?
 - a. Sodium
 - b. Aluminium
 - c. Zinc
 - d. Silver
- iv. The metal in which metal oxide layer act as a protective blanket and prevent its further oxidation is:
 - a. Aluminium
 - b. Lead
 - c. Zinc
 - d. All of the above
- v. The correct arrangement of metals in increasing order of their reactivity is
 - a. $Ag < Fe < Al < Na$
 - b. $Na < Al < Fe < Ag$
 - c. $Al < Na < Ag < Fe$
 - d. $Fe < Al < Na < Fe$

Objective Type Questions:

- Q2.** Which of the following oxide(s) of iron would be obtained on prolonged reaction of iron with steam?
 - a. FeO
 - b. Fe₂O₃
 - c. Fe₃O₄
 - d. Fe₂O₃ and Fe₂O₄
- Q3.** The highly reactive metals like Sodium, Potassium, Magnesium, etc. are extracted by the
 - a. electrolysis of their molten chloride
 - b. electrolysis of their molten oxides
 - c. reduction by aluminium
 - d. reduction by carbon
- Q4.** Which of the following non-metal is lustrous?
 - a. Sulphur
 - b. Oxygen
 - c. Nitrogen
 - d. Iodine
- Q5.** Assertion(A): Platinum, gold and silver are used to make jewellery.
Reason(R): These are least reactive metals.
 - a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - c. If Assertion is true but Reason is false.
 - d. If Assertion is false but Reason is true
- Q6.** Assertion(A): Carbon reacts with oxygen to form carbon dioxide which is an acidic oxide.
Reason(R): Non-metals form acidic oxides.
 - a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - c. If Assertion is true but Reason is false.
 - d. If Assertion is false but Reason is true

Short Answer Type Questions:

- Q7.** Write one example each of
- a metal which is so soft that, it can be cut with knife and a non-metal which is the hardest substance.
 - a metal and a non-metal which exist as liquid at room temperature.
- Q8.** Mention the names of the metals for the following:
- Two metals which are alloyed with iron to make stainless steel.
 - Two metals which are used to make jewellery.
- Q9.** Differentiate between metals and non-metals on the basis of their physical and chemical properties.
- Q10.** Define the following terms: amphoteric oxide, aquaregia, thermite process, roasting, calcinations and reactivity series.
- Q11.** i. Write electron dot structure of sodium, oxygen and magnesium.
ii. Show the formation of Na_2O and MgO by transfer of electrons.

Long Answer Type Questions:

- Q12.** How is the method of extraction of metals high up in the reactivity series different from that for metals in the middle? Why can the same process not be applied for them? Name the process used.
- Q13.** Explain electrolytic refining process of copper with the help of a diagram and also explain what happens at cathode and anode.
- Q14.** i. Write electron dot structure for chlorine (At No. 17) and calcium (At No. 20). Show the formation of calcium chloride by transfer of electrons.
ii. Identify the nature of above compound and explain three physical properties of such compound.
- Q15.** i. An ore on treatment with dilute hydrochloric acid produces brisk effervescences. What type of ore is this? What steps will be required to obtain metal from the enriched ore.
ii. Copper coin is kept immersed in silver nitrate solution for some time. What change will take place in coin and colour of the solution? Write balanced chemical equation of the reaction involved.
- Q16.** i. Define activity series of metals. Arrange the metals gold, copper, iron and magnesium in order of their increase in reactivity.
ii. What will you observe when:
a. Some zinc pieces are put in copper sulphate solution.
b. Some silver pieces are put into green coloured ferrous sulphate solution.

CHAPTER-4: Carbon Compounds

Case-based Type Questions:

- Q1.** The compounds which have the same molecular formula but differ from each other in physical or chemical properties are called isomers and the phenomenon is called isomerism. When the isomerism is due to difference in the arrangement of atoms within the molecule, without any reference to space, the phenomenon is called structural isomerism. In other words, structural isomers are compounds that have the same molecular formula but different structural formulas, i.e., they are different in the order in which different atoms are linked. In these compounds, carbon atoms can be linked together in the form of straight chains, branched chains or even rings.

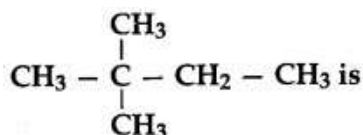
Read the passage carefully and answer the following questions:

- Which of the following sets of compounds have same molecular formula?
 - Butane and iso-butane
 - Cyclo hexane and hexene
 - Propanal and propanone
 - All of these
- In order to form branching, an organic compound must have a minimum of
 - four carbon atoms
 - three carbon atoms
 - five carbon atoms
 - any number of carbon atoms.

- iii. Which of the following is an isomeric pair?
- | | |
|-----------------------|-------------------------------|
| a. Ethane and propane | b. Ethane and ethene |
| c. Propane and butane | d. Butane and 2-methylpropane |
- iv. Among the following the one having longest chain is
- | | |
|--------------------|------------------------|
| a. neo-pentane | b. iso-pentane |
| c. 2-methylpentane | d. 2,2-dimethylbutane. |
- v. The number of isomers of pentane is
- | | |
|------|------|
| a. 2 | b. 3 |
| c. 4 | d. 5 |

Objective Type Questions:

- Q2. C_3H_8 belongs to the homologous series of
- | | |
|------------|------------------|
| a. Alkynes | b. Alkenes |
| c. Alkanes | d. Cyclo alkanes |
- Q3. The IUPAC name of



- | | |
|-----------------------------|-------------------------|
| a. 2-ethyl-2-methyl propane | b. 2, 2-dimethyl butane |
| c. 1,1,1-trimethyl propane | d. 2, 2-methyl butane |
- Q4. Name the functional group present in CH_3COCH_3 .
- | | |
|------------|--------------------|
| a. Alcohol | b. Carboxylic acid |
| c. Ketone | d. Aldehyde |
- Q5. Assertion(A) : If the first member of a homologous series is methanal, its third member will be propanal.
Reason (R) : All the members of a homologous series show similar chemical properties.
- | |
|--|
| a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion. |
| b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion. |
| c. If Assertion is true but Reason is false. |
| d. If Assertion is false but Reason is true |
- Q6. Assertion(A) : Carbon is the only element that can form large number of compounds.
Reason (R) : Carbon is tetravalent and shows the property of catenation.
- | |
|--|
| a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion. |
| b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion. |
| c. If Assertion is true but Reason is false. |
| d. If Assertion is false but Reason is true |

Short Answer Type Questions:

- Q7. In electron dot structure, the valence shell electrons are represented by dots or cross.
- The atomic number of chlorine is 17. Write it's electronic configuration.
 - Draw the electron dot structure of chlorine molecule.
- Q8. Write the molecular formula of the second and third member of the homologous series whose first member is methane.
- Q9.
 - Name a cyclic unsaturated carbon compound.
 - Draw the structures of three crystalline allotropes of carbon.
- Q10. Write the molecular formula of ethene and draw its electron dot structure.
- Q11. Define homologous series with example.

Long Answer Type Questions:

- Q12. Compare the ability of catenation of carbon and silicon.
- Q13.
 - How does ethanoic acid react with sodium hydrogen carbonate? Give the equation of the reaction which takes place.
 - Why are carbon and its compounds used as fuels for most applications?
 - Which of the two is better for washing clothes when the water is hard soap or detergent? Give the reason for your answer.

- Q14.** State the reason why carbon can neither form C^{4+} cations nor C^{4-} anions, but forms covalent compounds. Also state reasons to explain why covalent compounds-
- are bad conductors of electricity?
 - have low melting and boiling points?
- Q15.** Write the name and structure of an alcohol with three carbon atoms in its molecule.
- Q16.** i. What is meant by 'allotropes'? Name the various allotropes of carbon.
 ii. Why does carbon form largest number of compounds?
 iii. Why are some of these called saturated and other unsaturated compounds?

CHAPTER-6: Life Processes

Case-based Type Questions:

Q1. In human beings, the alimentary canal is a long tube with muscular walls, glandular epithelial lining and varying diameter. It extends from the mouth to the anal opening (anus). When uncoiled, the alimentary canal measures nearly 9 metre long tube in which the ducts of several digestive glands open to secrete their respective digestive secretions. The alimentary canal consists of several organs. These organs are given below in order in which they are involved in digesting food: mouth, buccal cavity, pharynx, oesophagus, stomach, small intestine, large intestine.

Read the passage carefully and answer the following questions:

- Salivary glands are present in which region of the alimentary canal?

a. Stomach	b. Small intestine
c. Buccal cavity	d. Oesophagus
- Pancreas secretes

a. Bile salts	b. Insulin and glucagon
c. Pepsin and lipase	d. Amylase and pepsin
- Which gland secretes bile?

a. Pancreas	b. Liver
c. Small intestine	d. Gall bladder
- In which part of alimentary canal is undigested food collected as faeces?

a. Colon	b. Rectum
c. Anal canal	d. None of these
- In which part of the alimentary canal food is finally digested?

a. Stomach	b. Mouth cavity
c. Large intestine	d. Small intestine

Objective Type Questions:

- Q2.** The following changes take place in an athlete's body during a 100 m race. Which change occurs first?
- Increased availability of oxygen to muscles
 - Increased breathing rate
 - Increased carbon dioxide concentration in the blood
 - Increased production of carbon dioxide by muscles
- Q3.** What prevents backflow of blood inside the heart during contraction?
- Valves in heart
 - Thick muscular walls of ventricles
 - Thin walls of atria
 - All of the above
- Q4.** During vigorous physical exercise, lactic acid is formed from glucose inside the muscle cells because
- there is lack of oxygen
 - there is lack of water
 - there is excess of carbon dioxide
 - none of the above
- Q5.** Assertion (A): Lungs always contain a residual volume of air.
 Reason (R): It provides sufficient time for oxygen to be absorbed and for carbon dioxide to be released.
- If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

Objective Type Questions:

- Q2.** Response of plant roots towards water is called:
a. Chemotropism
b. Phototropism
c. Hydrotropism
d. Geotropism
- Q3.** Which nerves transmit impulses from the central nervous system towards muscle cells?
a. Sensory nerves
b. Motor nerves
c. Relay nerves
d. Cranial nerves
- Q4.** A diabetic patient suffers from deficiency of which hormone?
a. Thyroxine
b. Testosterone
c. Oestrogen
d. Insulin
- Q5.** Assertion(A): Insulin regulates blood sugar level.
Reason (R): Insufficient secretion of insulin will cause diabetes.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true
- Q6.** Assertion(A): A receptor is a specialized group of cells in a sense organ that perceive a particular type of stimulus.
Reason (R): Different sense organs have different receptors for detecting stimuli.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short Answer Type Questions:

- Q7.** Trace the sequence of events which occur when a bright light is focused on your eyes.
- Q8.** Why are the electrical-chemical signals not an efficient means of communication in plants?
- Q9.** How is reflex arc formed?
- Q10.** Name the hormone that needs to be administered to
i. increase the height of a dwarf plant
ii. cause rapid cell division in fruits and seeds.
- Q11.** Nervous and hormonal system together perform the function of control and coordination in human beings. Justify the statement.

Long Answer Type Questions:

- Q12.** How are sensory neurons different from motor neurons?
- Q13.** How does feedback mechanism regulate the hormone action? Explain with the help of an example.
- Q14.** With the help of an activity demonstrate geotropism in plants
- Q15.** Give the various functions performed by the plant hormones.
- Q16.** With the help of a diagram describe the central nervous system in human beings.

CHAPTER-8: Reproduction

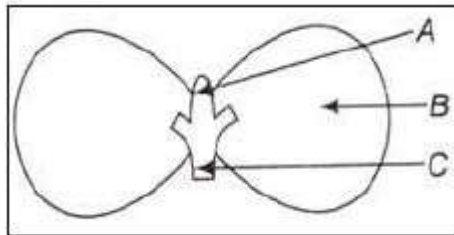
Case-based Type Questions:

- Q1.** In humans, if the egg is not fertilized, it lives for about one day. Since the ovary releases one egg every month, the uterus also prepares itself every month to receive a fertilized egg. Thus its lining becomes thick and spongy. This would be required for nourishing the embryo if fertilization had taken place. Now, however, this lining is not needed any longer. So, the lining slowly breaks and comes out through the vagina as blood and mucus. This cycle takes place roughly every month and is known as menstruation. It usually lasts for about two to eight days. Read the passage carefully and answer the following questions:
- i. What is the sexual cycle in human female that takes place every 28 days and marked by bleeding ?
- a. Sexual cycle
b. Reproductive cycle
c. Menstrual cycle
d. Blood cycle

- ii. If fertilisation takes place, it results in the formation of :
- an embryo
 - a zygote
 - a foetus
 - a placenta
- iii. Why does vaginal bleeding occur in human females on attaining puberty ?
- Unfertilised egg along with thick uterus lining come out of vagina in form of bleeding.
 - In human females, ovaries start releasing egg or ovum once every 28 days from the age of puberty.
 - If fertilisation does not occur then menstrual flow occurs at the end of cycle.
 - All of these
- iv. In what conditions vaginal bleeding will not occur in a human female who has attained puberty ?
- If the ovum is fertilized
 - If the ovum is not fertilised
 - If there is some hormonal imbalance in female
 - Both (a) and (b)
- v. Mark one change from the following associated with sexual maturation in boys ?
- loss of milk teeth
 - weight gain
 - increase in height
 - cracking of voice

Objective Type Questions:

Q2. In the below figure the parts A, B and C are sequentially



- Cotyledon, plumule and radical
 - Plumule, radicle and cotyledon
 - Plumule, cotyledon and radical
 - Radicle, cotyledon and plumule
- Q3. Which of the following is a contraceptive?
- Copper T
 - Condom
 - Diaphragm
 - All of these
- Q4. The correct sequence of organs in the male reproductive system for transport of sperms is
- Testes → vas deferens → urethra
 - Testes → ureter → urethra
 - Testes → urethra → ureter
 - Testes → vas deferens → ureter
- Q5. Assertion(A) : Spores are unicellular bodies.
Reason (R) : The parent body simply breaks up into smaller pieces on maturation.
- If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - If Assertion is true but Reason is false.
 - If Assertion is false but Reason is true
- Q6. Assertion(A): Testes lie in penis outside the body.
Reason (R): Sperms require temperature lower than the body temperature for development
- If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - If Assertion is true but Reason is false.
 - If Assertion is false but Reason is true

Short Answer Type Questions:

- Q7. Mention three limitations of vegetative propagation.
- Q8. Name any two types of asexual reproduction.
- Q9. Some flowers of pumpkin and bottle gourd develop fruits whereas other flowers fail to develop fruits. What may be the possible reason?

Q10. Describe the role of prostate gland, seminal vesicle and testes in the human male reproductive system.

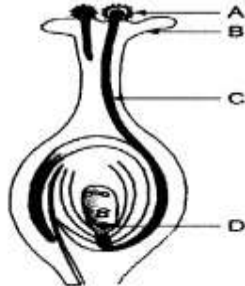
Q11. Why is variation so important?

Long Answer Type Questions:

Q12. Answer the following.

- i. Give reasons for avoiding frequent pregnancies by women.
- ii. Explain the following methods of contraception giving one example of each.
 - a. Barrier method
 - b. Chemical method
 - c. Surgical method

Q13. What is the significance of sexual mode of reproduction?



- i. Name the part marked 'A' in the diagram.
- ii. How does 'A' reach part 'B'.
- iii. State the importance of part 'C'.

Q14. What happens to the part marked 'D' after fertilisation is over?

Q15. What is pollination? How does it occur in plants? How does pollination lead to fertilization?

Q16. With the help of suitable diagram, explain the various steps of budding in Hydra.

CHAPTER-9: Heredity and Evolution

Case-based Type Questions:

Q1. Seema crossed pure breed pea plants having round-yellow seeds with wrinkled green seeds and found that only A-B type of seeds was produced in the F1 generation. When F1 generation pea plants having A-B type of seeds were cross-breed by self-pollination, then in addition to the original round yellow and wrinkled green seeds, two new varieties A-D and C-B types of seeds were also obtained.

- i. What are the A-B type of seeds?
 - a. Round -yellow
 - b. Round- green
 - c. Wrinkled- yellow
 - d. Wrinkled- green
- ii. A-D are _____ and C-B are _____ type of seeds.
 - a. Round green and wrinkled yellow respectively
 - b. Wrinkled green and round yellow respectively
 - c. Round yellow and wrinkled green respectively
 - d. Wrinkled green and round green respectively
- iii. A and B are _____ traits.
 - a. recessive
 - b. dominant
 - c. both a. and b.
 - d. None of these
- iv. Which one of these will be produced in maximum number in the F2 generation?
 - a. A-D
 - b. A-B
 - c. both (a) and (b)
 - d. None of these
- v. The above cross is known as :
 - a. Test cross
 - b. Monohybrid cross
 - c. Back cross
 - d. Dihybrid cross

Objective Type Questions:

Q2. Which one is a possible progeny in F2 generation of pure bred tall plant with round seed and short plant with wrinkled seeds?

- a. Tall plant with round seeds
- b. Tall plant with wrinkled seeds
- c. Short plant with round seed
- d. All of the above

- i. Recycling of paper is a good practice but recycled paper should not be used as food packaging because
 - a. recycled papers take lots of space
 - b. recycled papers can't cover food properly
 - c. recycled papers can cause infection
 - d. recycled papers are costly
- ii. Effective segregation of wastes at the point of generation is very important. Select the appropriate statements giving the importance of waste segregation.
 - I. less waste goes to the landfills
 - II. better for public health and the environment
 - III. help in reducing the waste
 - IV. resulting in deterioration of a waste picker's health
 - a. both I. and II.
 - b. both I. and III.
 - c. both II. and III.
 - d. both I. and IV.
- iii. Raw material used in bio gas plant is
 - a. Animal dung
 - b. crop residue
 - c. Food waste
 - d. All of the above
- iv. Disposable plastic plates should not be used because
 - a. they are made of materials with light weight
 - b. they are made of toxic materials
 - c. they are made of biodegradable materials
 - d. they are made of non-biodegradable materials
- v. Accumulation of non-biodegradable pesticides in the food chain increasing amount at each higher trophic level is known as
 - a. eutrophication
 - b. pollution
 - c. biomagnification
 - d. accumulation

Objective Type Questions:

- Q2.** Which of the two sets belong to the same trophic level?
- a. Rabbit : Tiger
 - b. Vulture : Rat
 - c. Grasshopper : Hawk
 - d. Frog : Lizard
- Q3.** In a given food chain if the amount of energy at the fourth trophic level is 6 kJ, what will be the energy available at the producer level?
- a. 6000 kJ
 - b. 20 kJ
 - c. 60 kJ
 - d. 600 kJ
- Q4.** Which of the statements is incorrect?
- a. All green plants and blue green algae are producers
 - b. Green plants get their food from organic compounds
 - c. Producers prepare their own food from inorganic compounds
 - d. Plants convert solar energy into chemical energy
- Q5.** Assertion(A): Green plants of the ecosystem are the transducers.
Reason(R): Producers trap the radiant energy of the sun and change it into chemical energy.
- a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - c. If Assertion is true but Reason is false.
 - d. If Assertion is false but Reason is true
- Q6.** Assertion(A): Biotic components of ecosystem continuously require energy to carry on life processes.
Reason(R): Abiotic components are the non-living factors of the ecosystem.
- a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - c. If Assertion is true but Reason is false.
 - d. If Assertion is false but Reason is true

Short Answer Type Questions:

- Q7.** "Energy flow in food chains is always unidirectional." Justify this statement. Explain how the pesticides enter a food chain and subsequently get into our body.

- Q8.** The depletion of ozone layer is a cause of concern. Why?
Q9. How can we help in reducing the problem of waste disposal? Suggest any three methods.
Q10. Give two examples of decomposers. State their important role in nature.
Q11. Why are crop fields known as artificial ecosystem?

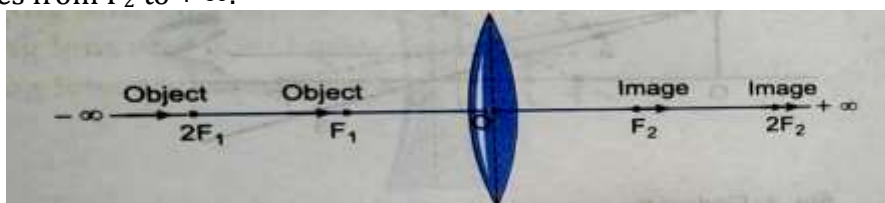
Long Answer Type Questions:

- Q12.** The first trophic level in a food chain is always a green plant. Why?
Q13. Write the harmful effects of using plastic bags on the environment. Suggest alternatives to plastic bags.
Q14. Differentiate between biodegradable and non-biodegradable substances with the help of one example each. List two changes in habit that people must adapt to dispose non-biodegradable waste for saving the environment.
Q15. Indicate the flow of energy in an ecosystem. Why is it unidirectional?
Q16. Write the essential function performed by ozone at the higher levels of the Earth's atmosphere. How is it? Name the synthetic chemicals mainly responsible for the drop of amount of ozone in the atmosphere. How can the use of these chemicals be reduced?

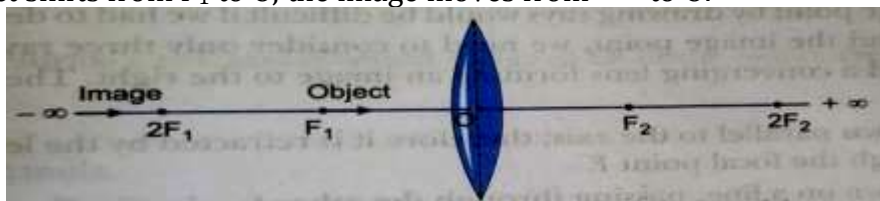
CHAPTER-10: Light-Reflection and Refraction

Case-based Type Questions:

- Q1.** The image formed by a convex lens depends on the position of the object in front of the lens. When the object is placed anywhere between focus and infinity, the image formed by convex lens is real and inverted. The image is not obtained on the screen when the object is placed between focus and the lens. The distance between the optical centre O of the convex lens and the focus point F_1 or F_2 is its focal length. When the object shifts from $-\infty$ to F_1 , the image moves from F_2 to $+\infty$.



When the object shifts from F_1 to O, the image moves from $-\infty$ to O.



A student did an experiment with a convex lens. He put an object at different distances from the lens. In each case he measured the distance of the image from the lens. The result were recorded in the following table.

Object distance (in cm)	25	30	40	60	120
Image distance (in cm)	100	24	60	30	40

Unfortunately his results are written in the wrong order.

- i. The focal length of this lens is
 - a. 20 cm
 - b. 25 cm
 - c. 30 cm
 - d. 35 cm
- ii. The image distance in the correct order (in cm) is
 - a. 24, 30, 40, 60, 100
 - b. 100, 24, 60, 40, 30
 - c. 100, 60, 30, 40, 24
 - d. 100, 60, 40, 30, 24
- iii. Which of this object distances give the biggest image?
 - a. 30 cm
 - b. 25 cm
 - c. 40 cm
 - d. 60 cm

- iv. The minimum distance between an object and its real image formed by a convex lens is
- 2f
 - 3f
 - 4f
 - zero
- v. A virtual image is formed by convex lens when object is placed
- at infinity
 - between C and F
 - at F
 - between F and O

Objective Type Questions:

- Q2.** A concave mirror of radius 30 cm is placed in water. Its focal length in air and water differ by
- 15
 - 20
 - 30
 - 0
- Q3.** A hole is made in a convex lens, then
- A hole appears in the image
 - Image size decreases
 - Image intensity decreases
 - No change
- Q4.** Two lenses of power +3 and – 1 dioptres are placed in contact. The focal length of the combined lens is
- 100 cm
 - 25 cm
 - 50 cm
 - 30.3 cm
- Q5.** Assertion(A): The mirrors used in search lights are concave spherical.
Reason(R): In concave spherical mirror the image formed is always virtual.
- If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - If Assertion is true but Reason is false.
 - If Assertion is false but Reason is true
- Q6.** Assertion(A): Light does not travel in the same direction in all the media.
Reason(R): The speed of light does not change as it enters from one transparent medium to another.
- If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - If Assertion is true but Reason is false.
 - If Assertion is false but Reason is true

Short Answer Type Questions:

- Q7.** One-half of a convex lens is covered with a black paper. Will this lens produce a complete image of the object? Verify your answers experimentally. Explain your observations.
- Q8.** A concave lens has focal length of 20 cm. At what distance from the lens a 5 cm tall object be placed so that it forms an image at 15 cm from the lens? Also calculate the size of the image formed.
- Q9.** “The refractive index of diamond is 2.42”. What is the meaning of this statement in relation to speed of light?
- Q10.** Which kind of mirrors are used in the headlights of a motor car and why?
- Q11.** Explain with the help of a diagram, why a pencil partly immersed in water appears to be bent at the water surface.

Long Answer Type Questions:

- Q12.** What is understood by lateral displacement of light? Illustrate it with the help of a diagram. List any two factors on which the lateral displacement of a particular substance depends.
- Q13.** i. If the image formed by a lens is diminished in size and erect, for all positions of the object, what type of lens is it?
ii. Name the point on the lens through which a ray of light passes undeviated.
iii. An object is placed perpendicular to the principal axis of a convex lens of focal length 20 cm. The distance of the object from the lens is 30 cm. Find
- the position
 - the magnification
 - the nature of the image formed.

- Q14.** i. With the help of a ray diagram explain why a concave lens diverges the rays of a parallel beam of light.
 ii. A 2.0 cm tall object is placed perpendicular to the principal axis of a concave lens of focal length 15 cm. At what distance from the lens, should the object be placed so that it forms an image 10 cm from the lens? Also find the nature and the size of image formed.
- Q15.** State the law of refraction of light that defines the refractive index of a medium with respect to the other. Express it mathematically. How is refractive index of any medium 'A' with respect to a medium 'B' related to the speed of propagation of light in two media A and B? State the name of this constant when one medium is vacuum or air.
 The refractive indices of glass and water with respect to vacuum are $\frac{3}{2}$ and $\frac{4}{3}$ respectively. If the speed of light in glass is 2×10^8 m/s, find the speed of light in:
 i. vacuum
 ii. water.
- Q16.** The image of a candle flame placed at a distance of 45 cm from a spherical lens is formed on a screen placed at a distance of 90 cm from the lens.
 Identify the type of lens and calculate its focal length. If the height of the flame is 2 cm, find the height of its image.

CHAPTER-11: The Human Eye and the Colourful World

Case-based Type Questions:

- Q1.** Atmospheric refraction is the phenomenon of bending of light on passing through earth's atmosphere. As we move above the surface of earth, density of air goes on decreasing. Local conditions like temperature etc. also affect the optical density of earth's atmosphere. On account of atmospheric refraction, stars seen appear higher than they actual are; advanced sunrise; delayed sunset, oval appearance of the sun at sunrise and sunset; stars twinkle, planets do not. Read the passage carefully and answer the following questions:
- i. Due to atmospheric refraction, apparent length of the day
 - a. Increases
 - b. Decreases
 - c. Remains the same
 - d. All of these
 - ii. Apparent position of the star appears raised due to
 - a. atmospheric refraction
 - b. scattering of light
 - c. both a. and b.
 - d. none of these
 - iii. The sun appears oval shaped or flattened due to
 - a. dispersion
 - b. scattering
 - c. atmospheric refraction
 - d. none of these
 - iv. Twinkling of stars and non-twinkling of planets is accounted for by
 - a. scattering of light
 - b. dispersion of light
 - c. atmospheric refraction
 - d. none of these
 - v. In absence of atmosphere, the colour of sky appears
 - a. blue
 - b. black
 - c. red
 - d. yellow

Objective Type Questions:

- Q2.** When light rays enter the eye, most of the refraction occurs at the
 i. crystalline lens
 ii. outer surface of the cornea
 iii. iris
 iv. pupil
- Q3.** Type of lens used in correction of myopia
 i. Convex lens
 ii. Concave lens
 iii. Reflecting lens
 iv. Bifocal lens
- Q4.** Farthest point of a normal eye is
 i. 25 cm
 ii. 50 cm
 iii. 75 cm
 iv. Infinity
- Q5.** Assertion(A): White light is dispersed into its seven-colour components by a prism.
 Reason(R): Different colours of light bend through different angles with respect to the incident ray as they pass through a prism.

- a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- c. If Assertion is true but Reason is false.
- d. If Assertion is false but Reason is true

Q6. Assertion(A): Danger signals are made of red colour.

Reason(R): Velocity of red light in air is maximum, so signals are visible even in dark.

- a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- c. If Assertion is true but Reason is false.
- d. If Assertion is false but Reason is true

Short Answer Type Questions:

Q7. What is myopia (near-sightedness)? Draw a ray diagram to show how it can be corrected using a lens.

Q8. Define the term dispersion of white light. State the colour which bends (i) the least and (ii) the most while passing through a glass prism.

Q9. Give reasons:

- i. The extent of deviation of a ray of light on passing through a glass prism depends on its colour.
- ii. Light of red colour are used for danger signals.

Q10. Draw a ray diagram to show the refraction of light through a glass prism. Mark on it

- i. the incident ray.
- ii. the emergent ray
- iii. the angle of deviation.

Q11. i. What are the values of

a. near point

b. far point of vision of a normal adult person?

- ii. A student has difficulty in reading the blackboard while sitting in the last row. What could be his defect of vision? Draw a ray diagram to illustrate this defect of vision.

Long Answer Type Questions:

Q12. i. What is meant by the power of accommodation of an eye?

- ii. A person with a myopic eye cannot see objects beyond 1.2 m directly. What should be the type of the corrective lens used? What would be its power?

Q13. When white light passes through a glass prism, seven colours namely red, orange, yellow, green, blue, indigo and violet are seen on the white screen. All these colours have different angles of deviation. Explain why ?

Q14. Write different parts of eye and explain their functions. Also explain, how an image of an object is formed on the retina of eye.

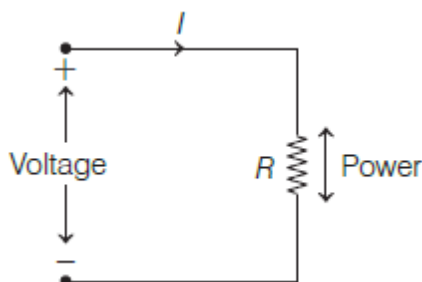
Q15. Due to gradual weakening of ciliary muscles and diminishing flexibility of the eye lens a certain defect of vision arises. Write the name of this defect. Name the type of lens required by such persons to improve the vision. Explain the structure and function of such a lens.

Q16. Why do different colours get separated when white light passes through prism? How can we recombine the components of white light after a prism has separated them? Explain with the help of figure.

CHAPTER-12: Electricity

Case-based Type Questions:

Q1. The electrical energy consumed by an electrical appliance is given by the product of its power rating and the time for which it is used. The SI unit of electrical energy is Joule (as shown in figure).



Actually, Joule represents a very small quantity of energy and therefore it is inconvenient to use where a large quantity of energy is involved.

Read the passage carefully and answer the following questions:

- i. The SI unit of electric energy per unit time is
 - a. joule
 - b. joule-second
 - c. watt
 - d. watt-second
- ii. Kilowatt-hour is equal to
 - a. 3.6×10^4 J
 - b. 3.6×10^6 J
 - c. 36×10^6 J
 - d. 36×10^4 J
- iii. The energy dissipated by the heater is E. When the time of operating the heater is doubled, the energy dissipated is
 - a. doubled
 - b. half
 - c. remains same
 - d. four times
- iv. The power of a lamp is 60 W. The energy consumed in 1 minute is
 - a. 360 J
 - b. 36 J
 - c. 3600 J
 - d. 3.6 J
- v. Calculate the energy transformed by a 5 A current flowing through a resistor of 2Ω for 30 minutes.
 - a. 40 kJ
 - b. 60 kJ
 - c. 10 kJ
 - d. 90 kJ

Objective Type Questions:

- Q2.** Electrical resistivity of a given metallic wire depends upon
 - a. its length
 - b. its thickness
 - c. its shape
 - d. nature of the material
- Q3.** An electric iron draws a current 4 A when connected to a 220 V mains. Its resistance must be
 - a. 1000Ω
 - b. 55Ω
 - c. 44Ω
 - d. None of these
- Q4.** The element used almost exclusively for filaments of incandescent lamps
 - a. copper
 - b. gold
 - c. silver
 - d. tungsten
- Q5.** Assertion (A): Tungsten metal is used for making filaments of incandescent lamps.
Reason (R): The melting point of tungsten is very low.
 - a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - c. If Assertion is true but Reason is false.
 - d. If Assertion is false but Reason is true
- Q6.** Assertion (A): A cell is a device which converts chemical energy into electrical energy.
Reason (R): Cell maintains a constant potential difference between its terminals for a long time.
 - a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - c. If Assertion is true but Reason is false.
 - d. If Assertion is false but Reason is true

Short Answer Type Questions:

- Q7.** What is meant by electrical resistivity of a material? Derive its S.I. unit. Write the factors on which the resistance of a conducting wire depends.
- Q8.** i. Write two points of difference between electric energy and electric power.
ii. Out of 60 W and 40 W lamps, which one has higher electrical resistance when in use.
iii. What is the commercial unit of electric energy? Convert it into joules.
- Q9.** Draw a schematic diagram of a circuit consisting of a battery of 12V, three resistors of 5Ω , 10Ω and 20Ω connected in parallel, an ammeter to measure the total current through the circuit, voltmeter to measure the potential difference across the combination of resistors.

- Q10.** An electric bulb of resistance 200Ω draws a current of 1 Ampere. Calculate the power of the bulb the potential difference at its ends and the energy in kWh consumed burning it for 5h.
- Q11.** Two identical wires one of nichrome and other of copper are connected in series and a current (I) is passed through them. State the change observed in the temperatures of the two wires. Justify your answer. State the law which explains the above observation.
- Long Answer Type Questions:**
- Q12.** When a high resistance voltmeter is connected directly across a resistor its reading is 2 V. An electric cell is sending the current of 0.4 A, (measured by an ammeter) in the electric circuit in which a rheostat is also connected to vary the current.
- Draw an equivalent labelled circuit for the given data.
 - Find the resistance of the resistor.
 - Name and state the law applicable in the given case. A graph is drawn between a set of values of potential difference (V) across the resistor and current (I) flowing through it. Show the nature of graph thus obtained.
- Q13.** State Ohm's law. How can this law be verified experimentally? Does Ohm's law hold good under all conditions. Comment.
- Q14.** What is Joule's heating effect ? List applications of Joule's heating effect in daily life.
- Q15.** Draw diagrams to show series and parallel combinations of resistors. State three salient features each of both the combinations.
- Q16.** What does an electric circuit mean? Name a device that helps to maintain a potential difference across a conductor in a circuit. When do we say that the potential difference across a conductor is 1 volt? Calculate the amount of work done in shifting a charge of 2 coulombs from a point A to B having potentials +10V and -5V respectively.

CHAPTER-13: Magnetic Effects of Current

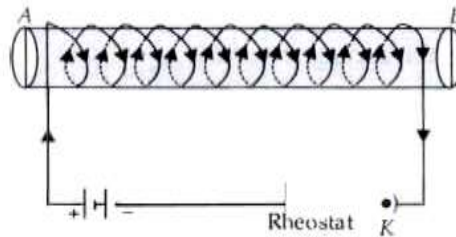
Case-based Type Questions:

- Q1.** An insulated copper wire wound on a cylindrical cardboard tube such that its length is greater than its diameter is called a solenoid. When an electric current is passed through the solenoid, it produces a magnetic field around it. The magnetic field produced by a current-carrying solenoid is similar to the magnetic field produced by a bar magnet. The field lines inside the solenoid are in the form of parallel straight lines. The strong magnetic field produced inside a current carrying solenoid can be used to magnetize a piece of a magnetic material like soft iron when placed inside the solenoid. The strength of the magnetic field produced by a current-carrying solenoid is directly proportional to the number of turns and strength of the current in the solenoid.
- Read the passage carefully and answer the following questions:
- The strength of magnetic field inside a long current-carrying straight solenoid is
 - more at the ends than at the centre
 - minimum in the middle
 - same at all points
 - found to increase from one end to the other.
 - The north-south polarities of an electromagnet can be found easily by using

a. Fleming's right-hand rule	b. Fleming's left-hand rule
c. Clock face rule	d. Left-hand thumb rule
 - A long solenoid carrying a current produces a magnetic field B along its axis. If the current is double and the number of turns per cm is halved, then new value of magnetic field is

a. B	b. 2B
c. 4B	d. B/2
 - For a current in a long straight solenoid N-and S-poles are created at the two ends. Among the following statements, the incorrect statement is
 - The field lines inside the solenoid are in the form of straight lines which indicates that the magnetic field is the same at all points inside the solenoid.
 - The strong magnetic field produced inside the solenoid can be used to magnetise a piece

- of magnetic material like soft iron, when placed inside the coil.
- The pattern of the magnetic field associated with the solenoid is different from the pattern of the magnetic field around a bar magnet.
 - The N- and S-poles exchange position when the direction of current through the solenoid is reversed.
- v. A soft iron bar is enclosed by a coil of insulated copper wire as shown in figure. When the plug of the key is closed, the face B of the iron bar marked as



- N-pole
- S-pole
- N-pole if the current is large
- S-pole if the current is small

Objective Type Questions:

- Q2.** The most important safety method used for protecting home appliances from short circuiting or overloading is by
- Earthing
 - Use of fuse
 - Use of stabilizers
 - Use of electric meter
- Q3.** Magnetic field lines around a straight conductor forms a pattern of
- concentric circles
 - concentric ellipse
 - straight line
 - square shape
- Q4.** The direction of magnetic field is given by
- Fleming's right hand rule
 - Fleming's left hand rule
 - Right hand thumb rule
 - Left hand thumb rule
- Q5.** Assertion(A): Alternating Current is used in household supply.
Reason (R): AC electric power can be transmitted over long distances without much loss of energy.
- If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - If Assertion is true but Reason is false.
 - If Assertion is false but Reason is true
- Q6.** Assertion(A): A current carrying wire deflects a magnetic needle placed near it.
Reason (R): A magnetic field exists around a current carrying wire.
- If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - If Assertion is true but Reason is false.
 - If Assertion is false but Reason is true

Short Answer Type Questions:

- Q7.** What is meant by solenoid? How does a current carrying solenoid behave? Give its main use.
- Q8.** What are magnetic field lines? Justify the following statements
- Two magnetic field lines never intersect each other.
 - Magnetic field lines are closed curves.
- Q9.** What is meant by the term 'frequency of an alternating current'? What is its value in India? Why is an alternating current considered to be advantageous over direct current for long range transmission of electric energy?
- Q10.** Write one application of each of the following:
- Right-hand thumb rule
 - Fleming's left hand rule
 - Fleming's right hand rule

Q11. Explain the role of fuse in series with any electrical appliance in an electric circuit. Why should a fuse with defined rating for an electric circuit not be replaced by one with a larger rating?

Long Answer Type Questions:

Q12. Suppose your science teacher asks you to demonstrate the phenomena of EMI with following materials:

- i. Two different coils 1 and 2 of copper wire having large no. of turns 50 and 100 respectively.
- ii. A non-conducting cylinder
- iii. A battery
- iv. A plug key
- v. A galvanometer.

Draw a labeled diagram of your demonstration setup.

Q13. Describe the activity that shows that a current-carrying conductor experiences a force perpendicular to its length and the external magnetic field. How does Fleming's left-hand rule help us to find the direction of the force acting on the current carrying conductor?

Q14. Define magnetic field and magnetic field lines. Write down the properties of magnetic field lines.

Q15. Define electromagnetic induction. Explain the ways by which magnetic field linked through a coil can be changed.

Q16. With the help of a labelled circuit diagram illustrate the pattern of field lines of the magnetic field around a current carrying straight long conducting wire. How is the right hand thumb rule useful to find direction of magnetic field associated with a current carrying conductor?